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UNITED STATES  
DEPARTMENT OF AGRICULTURE  
MISCELLANEOUS CIRCULAR 15

Washington, D. C.

March, 1924

IMPORTANCE OF FORESTRY AND THE NATIONAL FORESTS.

Information for Social and Civic Organizations in the Southwest.

*United States Forest Service, District 3, Albuquerque, N. Mex.*

FOREWORD.

PROMINENT among the problems that are engaging the Nation is that of an impending timber shortage. America was originally endowed with natural resources that seemed inexhaustible. In that belief the United States became a nation of thoughtless users and even wasters of the things that are necessary to the development and carrying on of present-day civilization.

This has been especially true in the matter of timber. The depletion of timber has gone so far that what in many localities was once an incumbrance to the land is now a valued commodity that must be brought from afar. Enormous freight bills and ever-mounting selling prices testify that lumber is no longer plentiful in America. Constantly shrinking forest areas proclaim that the time is near when regions capable of producing timber must grow their own or do without. Europe can hardly sustain itself and certain Provinces in Canada are already prohibiting exportations of pulp wood from Crown lands. Aroused to this condition economists are urging a national policy of forestry practice.

Some progress in constructive timber production has already been made, and though not soon enough to prevent timber scarcity will help to render it less hurtful. Several of the States, a few counties, and a number of cities have acquired timberlands and are administering them under approved timber growing practices. Under provision of the enabling act in Arizona and special cooperative agreements in both States, the State-owned forest areas in Arizona and New Mexico are handled in the same manner as the national forests. Sales of timber are in fact administered by Forest Service men loaned to the State for such lengths of time as they are needed.

## SUGGESTION.

This circular is the outgrowth of a demand by members of clubs and societies that are pursuing self-culture and current thought, and has been prepared for people who do not have time for exhaustive study of subjects that are not main objectives in life. No attempt at argument has been made. It is a collection of concise facts in sharp brevity. Those who find it possible to delve deeper, however, will find profitable and interesting reading in any or all of the following Government bulletins. They may be obtained for a nominal sum from the Superintendent of Documents, Government Printing Office, Washington, D. C., or without charge, while the supply lasts, from the District Forester, United States Forest Service, Albuquerque, N. Mex.

Forests and Forestry in the United States. (Forest Miscellaneous Circular.)

How the Public Forests are Handled. (Year Book Separate 847.)  
Wood for the Nation. (Year Book Separate 835.)

Timber Depletion and the Answer. (Department Circular 112.)  
Government Forest Work. (Department Circular 211.)

The Sunshine Recreation Ground of a Nation. (Forest and road map of Southwest with general information.)

The National Forests of Arizona. (Map and folder distributed by Forest Service.)

The National Forests of New Mexico. (Department Circular 240.)

In the Land of the Ancient Cliff Dweller; the Bandelier National Monument. (Miscellaneous Circular 5.)

Timber: Mine or Crop? (Yearbook Separate 886.)

## WHO PAYS THE FREIGHT?

The Nation's lumber shipment in 1920 was about 2,070,000 carloads, and the average haul for each carload 485 miles. According to the best estimate of the Forest Service, the freight bill on lumber for that year was \$275,000,000. A fraction of this sum wisely invested each year in forest protection and rehabilitation would grow timber where it is needed, reduce the Nation's freight bill, cheapen lumber, and release vast amounts of railroad equipment and labor for unavoidable transport. Coal and iron can not be grown, but timber can be.

## STUDY NO. 1.

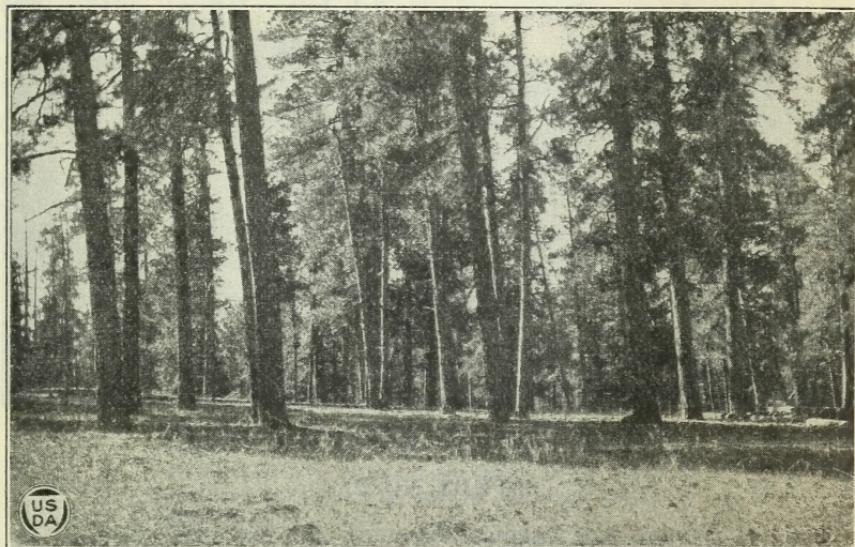
## AMERICAN FORESTS AND THE LUMBER INDUSTRY.

*What the early colonist found.*—When the colonist reached the shores of America he found a vast forest, almost unbroken, from Maine to Florida and westward for an unknown distance. It was composed of hardwoods—oaks, elms, beeches, maples, chestnuts, and hickories; and softwoods or conifers—pines, spruces, and hemlocks. It has been estimated that this great forest covered 822,000,000 acres, an area 10 times as large as New Mexico and 11 times as large as Arizona, and that it contained 5,200,000,000 board feet of timber.

*How the colonist regarded the forests and what he did with them.*—The colonist was dependent upon the soil for his living. Very little open land invited his plow. He naturally assumed that the

forest was his enemy and he fought it with every means at his command. The forest provided material for his house and warmed it, it is true, but once his improvements were made and his fuel supplied he had no use for what was left. The forests kept crowding back upon his farm land. They harbored the savage and the beast that preyed upon his progress. With ax and fire he finally won the battle, but he helped to cripple one of the best resources of his country.

*First sawmills.*—With the settling of the country it was not convenient for each man to go into the forest and cut the logs for his house. There was a demand for lumber and sawmills were started. They were small and crude affairs and turned out but little lumber, enough, however, for the needs of the times. These first mills were close to the settlements. All along the Atlantic coast each community had its mills. Logs were brought from the near-by woods,



Western yellow pine—the most important timber tree of the Southwest.

sawed into lumber, and the product hauled direct to the building sites.

*Development and expansion.*—As the population increased and spread out, greater and greater demands for lumber arose. Larger mills were built and lumbering became a trade. Ships that brought commodities from Europe carried lumber back. Shipyards in which wooden merchant vessels were constructed were established close to growing material. Railroads were thrust westward and lumber sent to prairie homesteads.

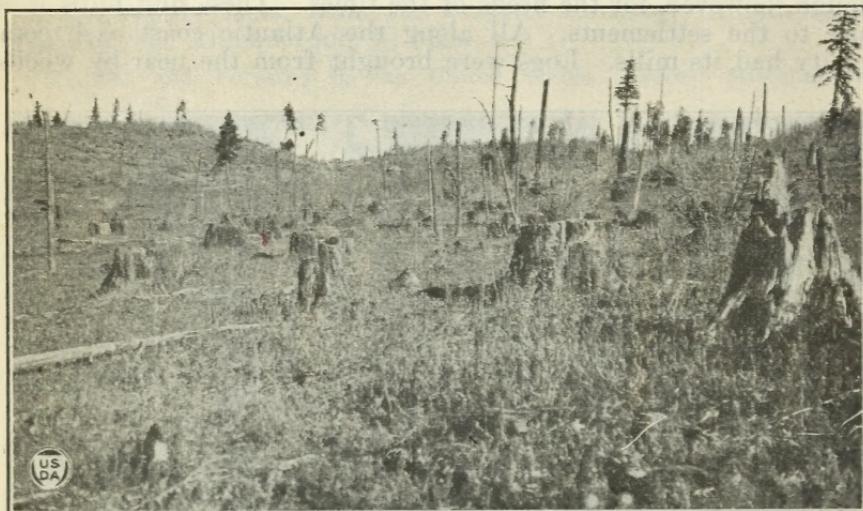
*Mills compelled to move.*—The history of the American lumber industry is a story of the depletion of forests and the migration of sawmills. This began on the coast of New England; then New York, Pennsylvania, the Great Lakes region, and the Southern States were included. The scene is at present shifting from the Southern States to the Pacific coast, and in this move we are nearing the closing

chapter. In the wake of this migration lie dreary cut-over wastes and fire-blackened hills, dismantled mills and deserted towns. On the western slope are the last big areas of virgin forest in the United States.

**NOT OURS FOR WASTING.**

*God has lent us the earth for our life. It is a great entail. It belongs as much to those who are to come after us as to us, and we have no right, by anything we do or neglect, to involve them in any unnecessary penalties or to deprive them of the benefit which it was in our power to bequeath.*

—Ruskin.



Destructive logging and fire make waste land.

**STUDY NO. 2.**

**WHERE THE AMERICAN FORESTS ARE SITUATED.**

*Atlantic coast forests.*—New England has passed through every stage of forest exploitation, from the days when nothing but the best white pines and oaks were considered merchantable to the present dependence upon other sections for lumber and pulp wood. The experience of New York and Pennsylvania has been similar to that of New England. From an original area of 110,000,000 acres, New England, New York, and Pennsylvania forests have shrunk to 40,000,000 acres, and much of this is second growth.

*Lake States forests.*—Michigan, Wisconsin, and Minnesota, commonly called the Lake States, once had one-eighth of the entire forested area of the United States. It covered 112,000,000 acres and from 1870 to 1900 yielded an annual cut of 8,000,000,000 feet. The area has been reduced to 24,000,000 acres and the output to 1,000,000,000 feet. Over 20,000,000 acres in the Lake States, suitable only for the growing of timber, are now fire-swept regions or devastated sad plains and swamps.

*Southern pine forests.*—The famous pineries of the South are still a most important factor in the lumber production of the Na-

tion. They furnish a third of the cut of the entire country and will remain important for at least another 10 or 15 years. Very little was done with the wonderful southern forests until after the Civil War, but depletion has been so rapid since that the end is already plainly in view.

*Pacific coast forests.*—Practically half of the remaining virgin timber in the United States is in the Pacific coast forests. Washington leads all States in the production of lumber, having recently wrested this honor from Louisiana. The trees of commercial importance on the Pacific coast are Douglas fir, western yellow pine, western hemlock, redwood, sugar pine, true fir, western red cedar, and lodgepole pine. Very little lumber was cut in California or the Northwest before the gold rush in 1849, but the inroad upon the last great reserve of coniferous timber has progressed far.

*Rocky mountain forests.*—The Rocky Mountain forests are those in Montana, Idaho, Wyoming, Utah, Colorado, western South Dakota, Nevada, Arizona, and New Mexico. Sixty-four million acres were embraced in the original forested areas of these States and there are still about 61,000,000 acres. The timber grows very slowly, however, and from 150 to 200 years are required for the principal lumber trees to mature. Montana and Idaho are the only States in this group producing lumber above their actual needs. Arizona has 5,000,000 acres in forest, and in 1921 cut 46,000,000 feet of lumber; the same year New Mexico, with forests covering 5,250,000 acres, cut 94,000,000 feet.

#### FOREST ODORS.

*Surely of all smells in the world the smell of many trees is the sweetest and most fortifying. The smell of a forest is infinitely changeful; it varies with the hour of the day not in strength merely, but in character; and the different sorts of trees as you go from one zone of the wood to another seem to live among different kinds of atmosphere.*

—Robert Louis Stevenson.

#### STUDY NO. 3.

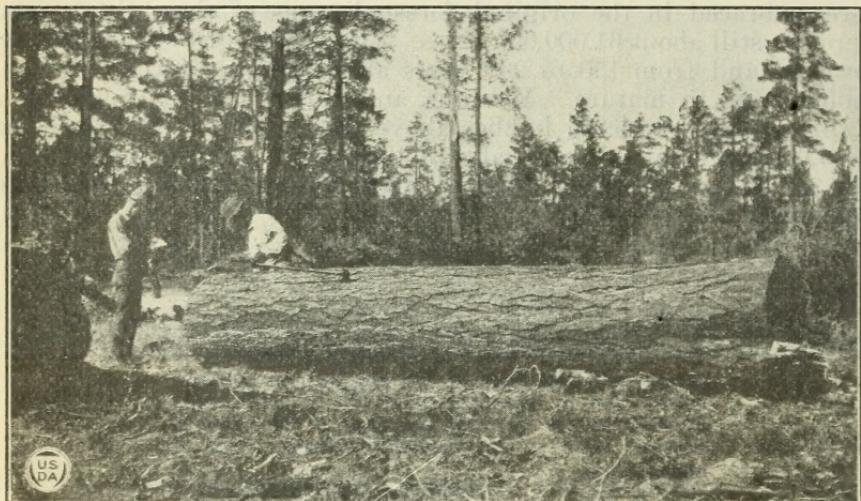
##### FORESTRY AND WHAT IT IS.

It has been demonstrated throughout the world that it is possible to harvest the mature or ripe timber from land and to grow another forest on the same area. Timber growing is an agricultural pursuit. It is very like the production of crops of alfalfa, corn, and wheat from farm land. Timber crop succession on the timber lands of the Southwest depends essentially upon the ability to secure the setting of the second crop by natural revegetation. The costs of reforestation by artificial means—that is, by planting—make that method impracticable for this region. Natural reproduction can be accomplished, however, through proper planning and handling of the forest before and during the harvest of the ripe timber. Making land that is best suited to tree growing yield successive crops of timber, including all the steps necessary to the process, is forestry.

*Forest benefits.*—Wood and its products enter in some form or other into practically every activity of life. They are absolutely

essential to our scheme of civilization. Forests, however, yield other benefits as well, intangible values that can not be reckoned on a balance sheet. They form, fix, and improve the soil. They bind the earth on steep slopes and prevent erosion. Old leaves cover the ground, and through decay make a humus that acts like a sponge. Water from rain and melting snow, instead of rushing away in roaring floods, is held back and fed out to springs and streams in a constant supply. By stabilizing the streamflow, the tearing away or burying under worthless mud of fertile valley fields and the filling of irrigation reservoirs and ditches with silt are avoided. Forests provide homes for harmless wild life and furnish to humanity delightful retreats from the scorching heat of summer. They are the Nation's playgrounds.

*Tree distribution.*—Approximately 500 species of trees are native to the United States and a great many others have become established through introduction from other countries. Climate, mois-



Harvesting the crop.

ture, soil, and certain other influences determine the distribution of trees. Hardwood trees demand rich soil, while as a general rule the softwoods—coniferous trees—though they exceed the hardwoods in commercial importance, are found on poorer soils. These conifers, the pines, the firs, and the spruces, with the help of junipers and pinions, make up the Rocky Mountain forests. They are the native trees of the Southwest. Practically no saw-timber forests are found in Arizona and New Mexico below an altitude of 6,000 feet. First above the treeless plains and valleys come the junipers and pinions, then the pines, and finally the firs and spruces.

*How trees grow.*—Trees grow in height by the formation of new wood cells on the top of the previous year's growth and in diameter by putting on a new layer of wood each year under the bark. The rate of growth depends upon soil, moisture, light, and heat. Different kinds of trees grow at different rates. Trees in a dense forest grow in height more rapidly than trees in the open on account of a constant struggle to reach the light. The age of a tree that has been

cut, can be told by counting the concentric rings of growth on the stump, or by boring into the living tree with an instrument that removes a small cylindrical section on which the annual growth rings show. No average rate of growth can be given for the great variety of trees in the United States, but in the Southwest it takes common lumber species 150 to 200 years to reach a diameter of 20 to 23 inches.

#### TIMBER HARVESTS.

*Timber is a crop—one of our most important crops. It grows, ripens, and becomes ready for the harvest just as other agricultural crops. It should be harvested in season and another crop grown for the use of future generations. It must be protected from fires, from plant diseases, from insect pests, just as other agricultural crops are protected.*

—Secretary Henry C. Wallace.

#### STUDY NO. 4.

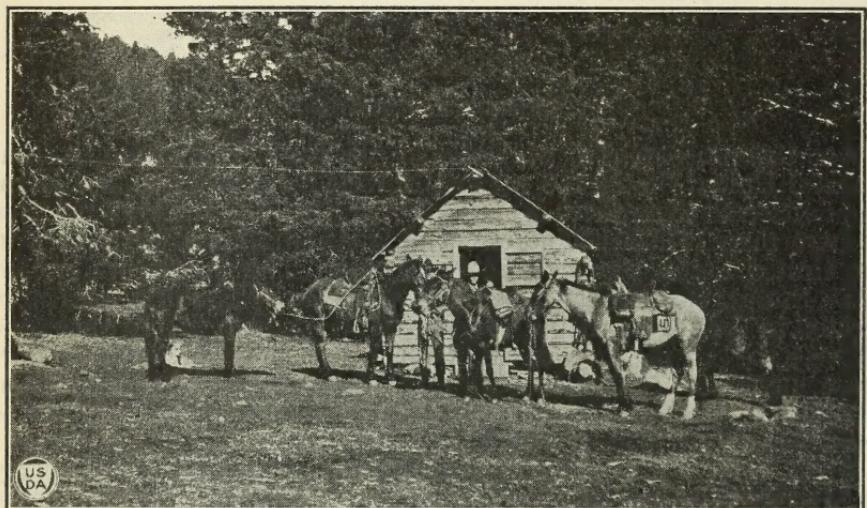
##### NATIONAL FORESTS.

*Location and extent of the national forests.*—There are in the continental United States 146 national forests including two in Alaska. In addition to these there is one in Porto Rico, and the total net area is more than 157,000,000 acres. The largest national forest area in the United States proper is in California. The forests are located in 27 States, most of them being in the West. The first ones were created in 1897 from the unreserved public domain and at that time all were west of the Mississippi River. Now, however, through purchase under the Weeks law, national forests are being established on the headwaters of important streams in the eastern mountains from Georgia to Maine.

*Property of all the people.*—The national forests are the property of all the citizens of the United States. While the people in the immediate vicinity no doubt receive the greatest amount of direct benefit from the national forests, they are but cosharers in ownership. Every person who enters a national forest has broad rights and privileges, but the exercise of these must be consistent with the rights and privileges of every other citizen. Forests are for use, but not for abuse. The Federal Government, through the Forest Service, is protecting and managing the national forests for the good of the whole people.

*What the public forests are for.*—As provided in the basic law of 1897, national forests have for their objects the improvement and protection of the forests within their boundaries, the securing of favorable conditions of waterflow, and the furnishing of a continuous supply of timber for the use of the citizens of the United States. This calls for the utilization of all the resources which the forests contain in ways which will make them of the greatest service, and this means the greatest good to the greatest number in the long run. It means conservation through use and the national forests will be so managed as to grow successive crops of timber on land best suited to timber production; they will exert their influence to prevent erosion and to control streamflow, to harbor game, and to furnish ideal recreation to all people who can reach them.

*National forests of the Southwest.*—There are 14 national forests in the Southwest, 8 in Arizona and 6 in New Mexico. These forests contain 19½ million acres of land, ranging in elevation from 5,000 to 12,000 feet. They include the Rocky Mountains of New Mexico, the Colorado Plateau of Arizona, scattered mountain ranges that rise from the deserts of the southern parts of these States, and the rough cactus and brush-covered watershed about the Roosevelt Reservoir. There are growing in them 23 billion feet of saw timber and 23 million cords of wood. Without these forests the Southwest would be scarcely habitable. Every acre of irrigated land is dependent upon the water that is conserved in the timbered mountains. Without them there would be no Roosevelt Lake or Elephant Butte Reservoirs; no verdant Salt River project with beautiful palms and orange groves; no Mesilla Valley with waving grain and fields of



The rangers keep watch over the forests.

cotton. Without the forests there would be no cities like Phoenix or Albuquerque, as we now know them, because there would be no adequate water supply for domestic use in cities. The forests of the Southwest are grazed annually by 520,000 cattle, 730,000 sheep and goats, 7,000 horses, and 800 swine; 500,000 recreationists visit them every year, and many permanent summer homes, municipal camps and playgrounds, and public picnic areas have been established.

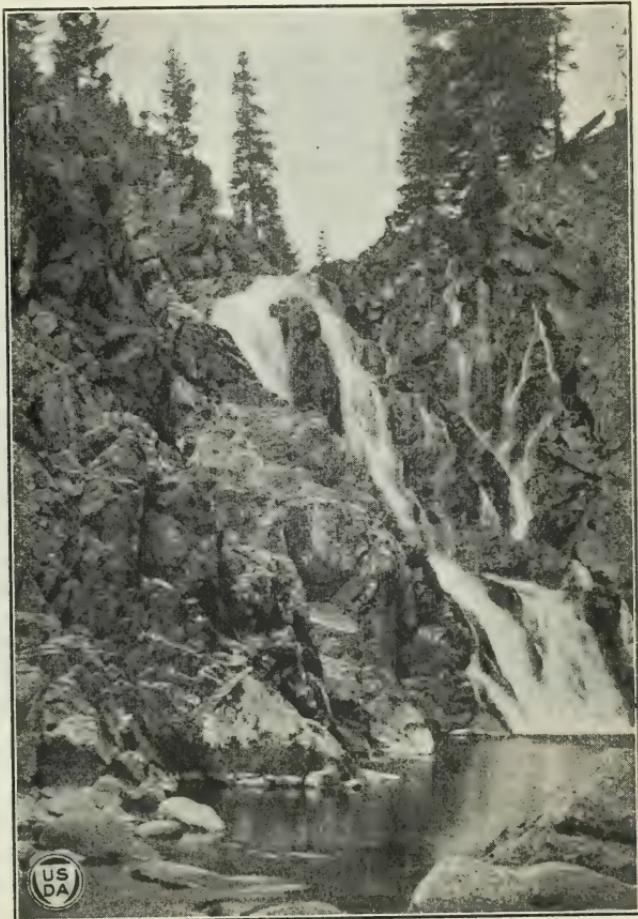
#### STUDY NO. 5.

##### MANAGEMENT OF FOREST LANDS.

*Highest use.*—The national forests, as well as most other timber-lands, occupy areas that are generally mountainous. Much of the land within the forests is rugged. It will grow trees, but is unsuitable for almost any other purpose. Such places meet their highest use in the production of timber. The production of timber on the headwaters of streams is consistent with the protection of watersheds from which cities and irrigation projects obtain their water

supplies; it is consistent with the grazing of reasonable numbers of livestock and the harboring of wild game, and it in nowise prohibits camping and other recreational uses of the forest. It is, in fact, the only practice that ensures all of these things to the people. The Federal law requires that the national forests be managed so that when timber is removed as it becomes ripe for cutting the areas will be left in shape to produce new crops of timber.

*Forest products.*—It is not unusual to think of forest products as lumber, timber, pulp wood for print paper, and fuel, and to

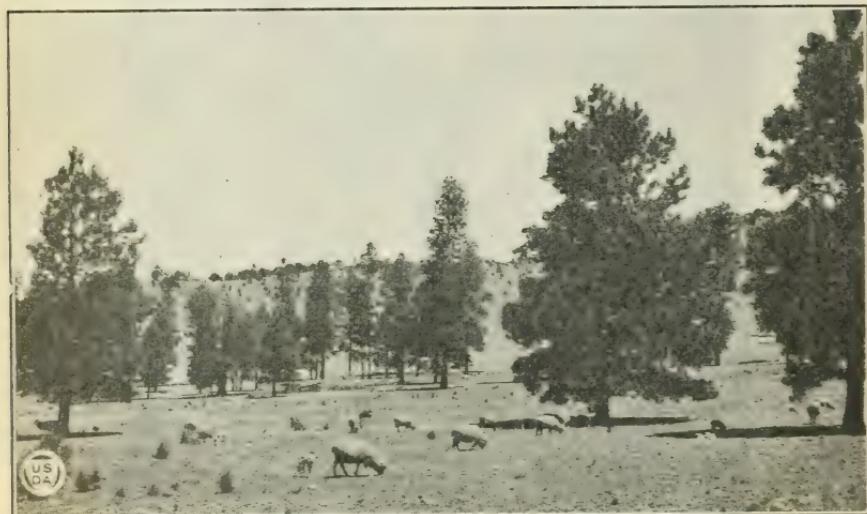


Forested mountains mean irrigated valleys.

forget the numberless things into the composition of which wood enters. Turpentine and rosin come from pines. Methyl or wood alcohol is being distilled from hardwoods and ethyl or "grain" alcohol from softwoods. Phonograph records are 60 to 80 per cent wood flour. Linoleum is made from wood flour and linseed oil. Artificial silk is manufactured from wood cellulose, and certain styles of furniture from paper reeds. Twine, viscose sausage casings, woven bags, baskets, and many other things are being made of paper, the fibers of which grew in the woods. The United States

is producing half of the lumber cut of the world and using 95 per cent of it at home. The consumption and destruction of wood in the United States amounts to about 56,000,000,000 board feet annually. The present population of Arizona and New Mexico is using 300,000,000 feet a year, not including cordwood or mine props. As the Southwest develops and the population increases, demand for timber here as elsewhere will increase correspondingly.

*Need for management.*—The United States contains 469,000,000 acres of forest land of all sorts, timbered, cut-over, and burned. Most of this should always be forest land. It is an area which, if it can be kept at work growing trees, is ample to furnish all of the wood needed for home use and for export trade. Eighty million acres of these forest lands, however, have been denuded to the point of absolute idleness so far as the production of timber of commercial value is concerned and millions of other acres of cut-over land are reproducing at but a fraction of their capacity. This waste is



Proper range management makes sheep grazing in the forests profitable.

being increased through fire and destructive lumbering by 10 to 15 million acres every year. Timber is being cut or destroyed four times as fast as timber is growing. Freight on lumber into States that have idle forest lands costs hundreds of millions of dollars every year. Fishing, hunting, and other recreational pursuits are everywhere subjected to sharp limitations. Because of devastated watersheds, floods follow continued rains and bring damage beyond realization alike to town and farm, while cities run short of water during drought.

*Things that hinder.*—Timberland owners are unable to see profit in growing a crop that requires 150 to 200 years to mature and which will be harvested by a future generation. Distances between timber and transportation lines or markets, and lack of near-by market for by-products work in combination with rough topography and small number of trees per acre to prevent the manufacture of lumber cheap enough to carry the interest of the owner beyond the harvesting of the

present crop. Many operators are not owners and do their logging at the least possible cost without regard to the use to which the land may be put afterwards. Heavy grazing of forest lands, which can not be overcome at once because of enormous investments in range improvements that require long continued use in order to pay out, interferes with the greatest production of timber. Forest fires, particularly those caused by human beings, constitute a tremendous obstacle in the way of successful management of both publicly and privately owned forest land, as years of effort may be lost in a few hours of conflagration.



Seed trees and proper disposal of brush make possible a new stand of timber after logging.

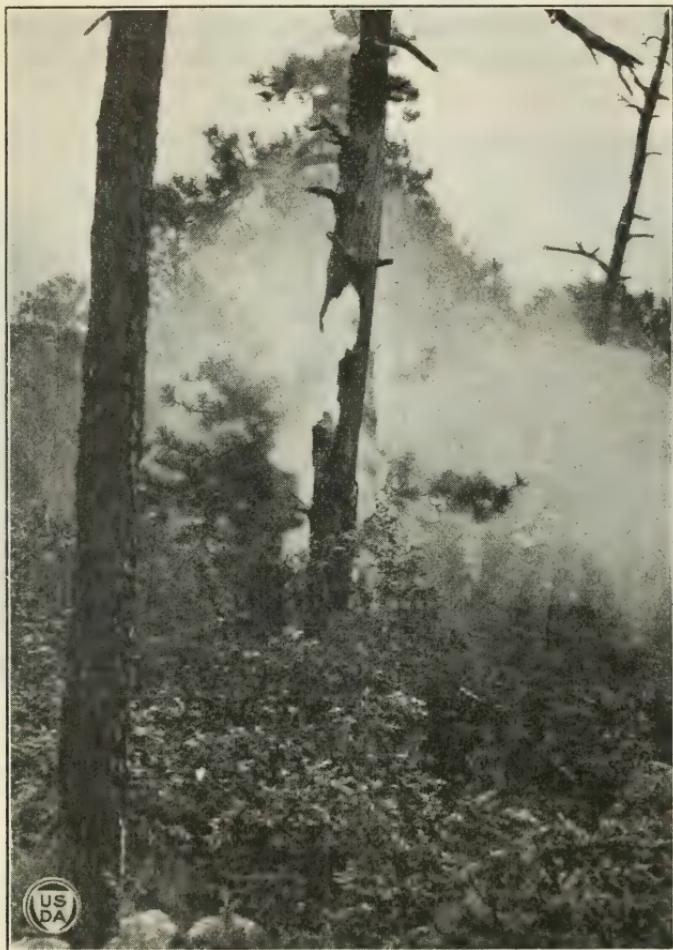
#### **FIRES: THE ARCH ENEMY OF FORESTS.**

From 500 to 1,000 fires are put out by Forest Service employees in the Southwest each year. Rangers and fire guards reach a great number of these fires and extinguish them while they are small, but each fire is a menace to public property and welfare.

Two-thirds of the fires are caused by lightning and are unavoidable. Those comprising the other third are due to carelessness and could be entirely eliminated if every citizen would regard the national property as he does his own house and would exercise the same care. The average person is not wilfully careless, but he is often woefully uninformed. It is for his benefit that the "Six rules" are given on page 16.

The damage wrought by crown fires—that is, fires that get into the tops and burn even the grown trees—is obvious and requires no comment. The blackened wastes speak for themselves, but the damage done by ground fires that burn only along the surface of the earth is less well known. These ground fires kill the little seedlings, and these little seedlings are the keystone of forestry. Especially is

this true in the Southwest, where the climate makes it exceedingly difficult to establish a natural growth of seedlings preparatory to the removal of the mature crop. Artificial planting of seedlings is almost prohibitive in cost, so that the ground fire that burns natural reproduction destroys the forest just as surely as if it consumed all the trees at once.



Fire, the arch enemy of the forest.

Ground fires scar the bases of large trees and through these wounds enter fungous rots, which work invisibly in the tree and destroy its value for lumber. Every forest fire, whether severe or light, big or little, is a curse to the forest and the community, and an enemy to the public welfare.

**PREVENT FOREST FIRES**

## CONCLUSION.

The forest lands of the United States at work would mean settled communities and permanent industries. It would mean not only continuous supplies of lumber and other timber products for those who live close by, but a surplus for the farms and cities in the parts where timber is not grown. It would mean a decrease in flood menace through control of streamflow, and increased agricultural prosperity where land is irrigated. Wild plant and animal life could be established to the delight of a nature-loving public, while health giving recreation such as can be found only in forest and stream would be within reach of millions who need the out of doors.

In the Southwest the annual per capita consumption of timber and timber products is 500 board feet. Properly cut-over timber-lands in this region can be made to produce a yearly growth of 50 to 100 board feet per acre (more favored regions runs three to five times as much). Ten acres of growing timber for each person would be required to supply the timber needs of the population, it is true, but with the 11,000,000 acres of forest land in Arizona and New Mexico managed so as to do their best there can be cut every year timber products sufficient to supply the common timber needs of a million people and the yield sustained in perpetuity.

Certainly agriculture in no part of the country can be benefited more by regulated streamflow and a consequent permanent supply of water for irrigation than in the southwest, where the greater part of the farming is dependent upon other moisture than direct rainfall. Future supplies of fish and game can be assured only through forest perpetuation. Recreation, essential to the health and happiness of southwestern people, reaches its ideal in forest cover on every forest acre.

Management of the country's forests is more than a local affair. Lands that are not fit for general farming but which will support trees become a public liability if not kept busy growing trees. It is a problem for the Nation. On its solution depends the stability of government and the progress of a great people. It is useless to grow timber and then burn it up in forest fires. Protection of the timber resources is a proposition too big for private enterprises to meet individually. Comprehensive plans in which the owner, and State, and Federal Governments work hand in hand offer the only hope of success. Management of forest lands so that they will be constantly productive should be made economically feasible by tax adjustment and whatever additional steps are locally necessary.

## TREES.

*I think that I shall never see  
A poem lovely as a tree.  
A tree whose hungry mouth is prest  
Against the earth's sweet flowing breast;  
A tree that looks at God all day,  
And lifts her leafy arms to pray;  
A tree that may in summer wear  
A nest of robins in her hair:  
Upon whose bosom snow has lain;  
Who intimately lives with rain.  
Poems are made by men like me,  
But only God can make a tree.*

—Joyce Kilmer.

**OUTSTANDING POINTS IN FOREST SERVICE HISTORY.**

On August 16, 1876, Congress appointed Dr. Franklin B. Hough as Commissioner of Forestry.

In 1877 Congress granted its first appropriation, \$6,000 for forestry purposes.

In 1881 the Division of Forestry was established in the Department of Agriculture as an information bureau only.

By act of Congress, March 3, 1891, the President was given power to establish forest reservations and President Harrison established the Yellowstone Park Timber Land Reserve.

The act of June 4, 1897, authorized the administration of the forest reserves, which were then under the Department of the Interior.

On July 1, 1898, there were 6 clerks and 6 scientific employees in the Division of Forestry.

The act of February 1, 1905, transferred the forest reserves and the authority to administer them from the Secretary of the Interior to the Secretary of Agriculture, and the work of the service as we know it to-day began. In July, 1905, the Bureau of Forestry became the Forest Service.

In 1907 the name of the forest reserves was changed to national forests to correct the impression that they were withdrawn from use.

In 1908 the direct administration of field work was transferred from Washington to six district headquarters in the West, and in 1914 a similar district was established in the Appalachian region, while district 8, comprising the Alaskan Forests, was created in 1921. National forests now number 146 and embrace approximately 157,000,000 acres.

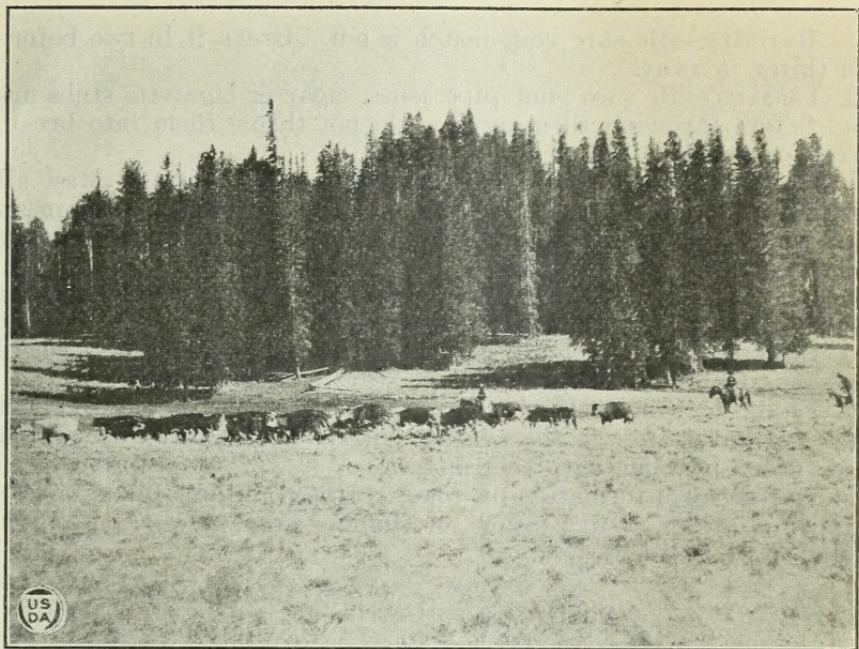
***THE FOREST IS YOUR FRIEND.***

*The water you drink comes from it.  
Nothing you use or wear could be yours without  
the forest's help.*

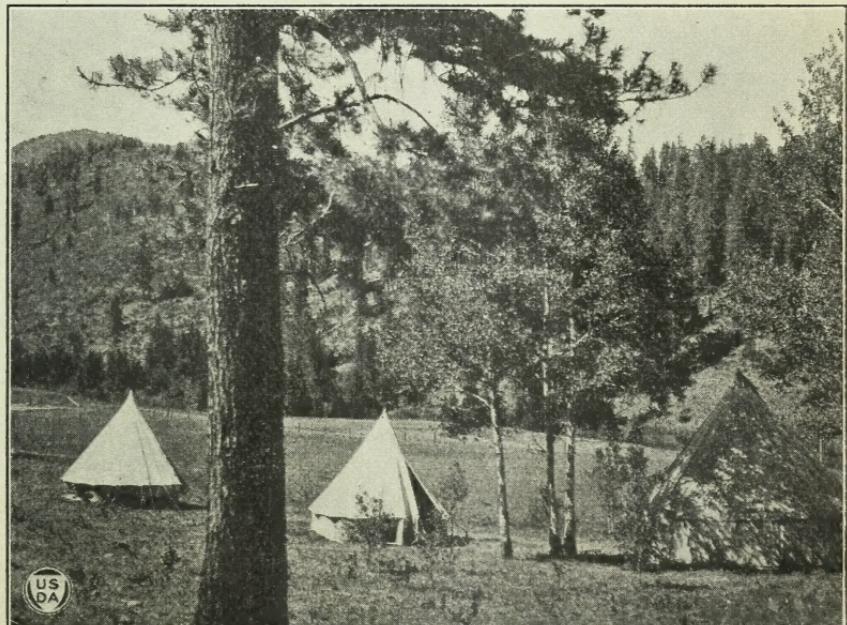
*The forests are your playground.  
They are wide open for you to fish, hunt, and  
camp.*

—Gifford Pinchot.

***THE FOREST FIRE IS YOUR ENEMY.***



Thousands of cattle graze in the meadows of the southwestern forests.



Recreation grounds in the heart of the forest.

**SIX RULES FOR PREVENTION OF FOREST FIRES.**

1. MATCHES.—Be sure your match is out. Break it in two before you throw it away.
2. TOBACCO.—Be sure your pipe ashes, cigar or cigarette stubs are dead before throwing them away. Do not throw them into brush, leaves, or needles.
3. MAKING CAMP.—Build a small camp fire. Scrape away all trash and inflammable material from the spot. Build the fire in an open space and not against a tree or log or near brush. Scrape away the trash from around it.
4. LEAVING CAMP.—Never leave a camp fire unattended, even for a short time. Quench it with water or earth.
5. BONFIRES.—Never build bonfires in windy weather or where there is the slightest danger of their escaping from control.
6. FIGHTING FIRES.—If you find a fire, try to put it out. If you can't, get word of it to the nearest United States forest ranger at once. Keep in touch with the rangers.

If you desire information on roads, trails, camping places, hunting, fishing, timber, stock range, or summer home sites, **ASK THE FOREST RANGER.**

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